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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,799	11/28/2006	Timothy Cameron Ralph	4894-0001	5231
27123	7590	12/29/2008		
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			EXAMINER CALLAWAY, JADE R	
			ART UNIT	PAPER NUMBER
			2872	
			NOTIFICATION DATE	DELIVERY MODE
			12/29/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/577,799	Applicant(s) RALPH ET AL.	
	Examiner JADE CALLAWAY	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/11/08, 4/28/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☒ Claim(s) 6-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/11/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species A in the reply filed on 11/11/08 is acknowledged. The traversal is on the ground(s) that it is not burdensome to search Species B since a keyword search could encompass both species. This is not found persuasive. The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of such species. In addition, these species are not obvious variants of each other based on the current record.

There is an examination and search burden for these patentably distinct species due to their mutually exclusive characteristics. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and the prior art applicable to one species would not likely be applicable to another species.

2. The requirement is still deemed proper and is therefore made FINAL.

3. Claim 4 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species B, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/11/08.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Response to Amendment

5. The preliminary amendments to the claims and the specification, in the submission dated 11/11/08, are acknowledged and accepted.

Specification

6. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

7. The abstract of the disclosure is objected to because the use of the following language:

"The invention is in the filed of," line 1

"This invention concerns," lines 1-2

"The frequency beamsplitter comprises," line 4

Correction is required. See MPEP § 608.01(b).

Claim Objections

8. Claims 6-10 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent

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claim. See MPEP § 608.01(n). Accordingly, the claims 6-10 have not been further treated on the merits.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gisin et al. (6,438,234) in view of Boyd et al. (2003/0231826).

Consider claim 1, Gisin et al. discloses (e.g. figure 1) a frequency beamsplitter for use in the frequency basis, comprising: an asymmetric two-path interferometer (4, interferometer), reversible down to the quantum limit, a first partially transmitting mirror (first beamsplitter of interferometer 5) to split the photons into first and second paths, a time delay element (52, delay line) to introduce a differential time delay into the second path, and a second partially transmitting mirror (second beamsplitter of interferometer 5) to mix the two paths again to form two outputs [col. 2, lines 32-62]. However, Gisin et al. do not disclose a pair of input photons that are separated by the time delay element in frequency space by radio or microwave frequencies. Gisin et al. and Boyd et al. are related as apparatuses utilizing time delay elements. Boyd et al. teaches (e.g. figure 1) a time delay element (12(1)-12(n), resonators) that separates a pair of input photos by radio or microwave frequencies [0026,0061,0102]. The separation time delay frequency of 88GHz is calculated using a phase shift of 2π , an index of refraction of 3.4, a

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distance d of $1000\mu\text{m}$ (note that Boyd et al. discloses that 100 resonators can be used that are separated by $10\mu\text{m}$), and where c is the speed of light. 88GHz is in the range of radio or microwave frequencies. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of Gisin et al., as taught by Boyd et al., in order to selectively control the time delay amount by changing the amount of resonators used or the index of refraction to manipulate and shape the pulse as needed.

Consider claim 2, the modified Gisin et al. reference discloses (e.g. figure 1 of Boyd et al.) a frequency beamsplitter wherein the interferometer has a frequency dependent phase shift (52, delay line imparts a frequency dependent phase shift) [0061 of Boyd et al.].

Consider claim 3, the modified Gisin et al. reference discloses (e.g. figure 1 of Gisin et al.) a frequency beamsplitter wherein the interferometer is a Mach-Zehnder interferometer [col. 2, lines 32-62 of Gisin et al.].

11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gisin et al. (6,438,234) in view of Boyd et al. (2003/0231826) as applied to claims 1-3 above above, and further in view of Wright et al. (6,552,800).

Consider claim 5, the modified Gisin et al. reference does not disclose a frequency beamsplitter wherein additional mirrors are provided between the partially transmitting mirrors or at the output to redirect the first and second paths to provide the outputs at convenient locations. Gisin et al., Boyd et al. and Wright et al. are related as optical manipulating devices. Wright et al. teach (e.g. figure 1) an apparatus provided

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with additional mirrors (19, 31, mirrors) at the output to redirect the first and second paths to provide the outputs (21, 34, photodetectors) at convenient locations [col. 10, lines 37-49]. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the device of the modified Gisin et al. reference, as taught by Wright et al., in order to change the direction of the output light so that it can be detected at a convenient location depending on the layout of the apparatus.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JADE CALLAWAY whose telephone number is (571)272-8199. The examiner can normally be reached on Monday to Friday 7:00 am - 4:30 pm est.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JRC
/Jade R. Callaway/
Examiner, Art Unit 2872

/Stephone B. Allen/
Supervisory Patent Examiner
Art Unit 2872